

THE INVENTION CLAIMED IS

1. A method of fabricating a DNA molecule of user-defined sequence, comprising the steps of:

preselecting a multiplicity of DNA sequence segments that will comprise said DNA molecule of user-defined sequence,

separating said DNA sequence segments temporally, and

combining said multiplicity of DNA sequence segments with at least one polymerase enzyme wherein said multiplicity of DNA sequence segments join to produce said DNA molecule of user-defined sequence.

2. The method of fabricating a DNA molecule of user-defined sequence of claim 1 wherein said step of separating said DNA sequence segments temporally is accomplished by said DNA sequence segments being added gradually, in sequence order.

3. The method of fabricating a DNA molecule of user-defined sequence of claim 1 wherein said step of separating said DNA sequence segments temporally is accomplished by said DNA sequence segments being added gradually, in an order that is predicted computationally to minimize errors.

4. A method of fabricating a DNA molecule, comprising the steps of:

preselecting a multiplicity of DNA sequence segments that will comprise said DNA molecule,

separating said DNA sequence segments temporally, and

combining said multiplicity of DNA sequence segments with at least one polymerase enzyme wherein said multiplicity of DNA sequence segments join to produce said DNA molecule.

5. The method of fabricating a DNA molecule of user-defined sequence of claim 4 wherein said step of separating said DNA sequence segments temporally

is accomplished by said DNA sequence segments being added gradually, in sequence order.

6. The method of fabricating a DNA molecule of user-defined sequence of claim 1 wherein said step of separating said DNA sequence segments temporally is accomplished by said DNA sequence segments being added gradually, in an order that is predicted computationally to minimize errors.

7. The method of fabricating a DNA molecule of user-defined sequence of claim 1 wherein said multiplicity of DNA sequence segments comprise n-mers, wherein n is an even number.

8. The method of fabricating a DNA molecule of user-defined sequence of claim 1 wherein said multiplicity of DNA sequence segments comprise n-mers, wherein n is an odd number.

9. The method of fabricating a DNA molecule of user-defined sequence of claim 1 wherein said multiplicity of DNA sequence segments comprise n-mers and said n-mers are of a size $n+1$, $n+2$, etc.

10. The method of fabricating a DNA molecule of user-defined sequence of claim 1 wherein said multiplicity of DNA sequence segments comprise oligos in multiple reading frames.

11. A method of fabricating a DNA molecule of user-defined sequence, comprising the steps of:

preselecting a multiplicity of DNA sequence segments that will comprise said DNA molecule of user-defined sequence by using computational techniques to break said user-defined sequence into fragments of defined size, arraying said fragments of defined size into groups, separating said DNA sequence segments temporally, and

assembling said groups into double-strand DNA molecules of predetermined base-pairs using DNA polymerase to produce said DNA molecule of user-defined sequence.

12. The method of fabricating a DNA molecule of user-defined sequence of claim 11 wherein said step of separating said DNA sequence segments temporally is accomplished by said DNA sequence segments being added gradually, in sequence order.

13. The method of fabricating a DNA molecule of user-defined sequence of claim 11 wherein said step of separating said DNA sequence segments temporally is accomplished by said DNA sequence segments being added gradually, in an order that is predicted computationally to minimize errors.

14. The method of fabricating a DNA molecule of user-defined sequence of claim 11 wherein said multiplicity of DNA sequence segments comprise n-mers, wherein n is an even number.

15. The method of fabricating a DNA molecule of user-defined sequence of claim 11 wherein said multiplicity of DNA sequence segments comprise n-mers, wherein n is an odd number.

16. The method of fabricating a DNA molecule of user-defined sequence of claim 11 wherein said multiplicity of DNA sequence segments comprise n-mers and said n-mers are of a size $n+1$, $n+2$, etc.

17. The method of fabricating a DNA molecule of user-defined sequence of claim 11 wherein said multiplicity of DNA sequence segments comprise oligos in multiple reading frames.